Department of Energy/Oak Ridge

- Based in Oak Ridge, Tennessee, the Department of Energy Oak Ridge Office (DOE-ORO) is rich in history, dating back to World War II when the organization played a major role in the production of enriched uranium for the Manhattan Project. Since then, ORO has expanded far beyond that first mission and today is responsible for major programs in science, environmental management, nuclear fuel supply, and national security and support is provided to science laboratories and facilities operated by DOE throughout the United States. ORO also provides support to national security activities managed by the National Nuclear Security Administration (NNSA).

Department of Energy/Oak Ridge (continued)

- The majority of ORO programs are performed at facilities located on the 33,725-acre Oak Ridge Reservation located in Anderson and Roane Counties in East Tennessee. The Oak Ridge facilities include the Townsite; the Oak Ridge National Laboratory (ORNL); the Y-12 National Security Complex (NSC); and the East Tennessee Technology Park (ETTP). Approximately 12,000 employees work at the Oak Ridge facilities, thus providing a major source of economic impact to the State of Tennessee.

Oak Ridge Reservation Map

- The Oak Ridge Reservation map (see Oak Ridge Reservation Map.pdf in this directory) shows the 3 plant sites as well as the Townsite locations that are served by the Oak Ridge Federal – Integrated Communications Network (ORF-ICN). The map is to scale. The red dots depict the various Townsite locations.

The Townsite

- The Townsite refers to the part of the Oak Ridge Reservation that is not on one of the three plant sites.
- Townsite locations include the Federal Building (FB), the Office of Scientific and Technical Information (OSTI), the American Museum of Science and Energy, the Oak Ridge Institute for Science, Education (ORISE) and various other facilities in and around the Reservation.

Townsite Central Offices

- The are two 5E remote switching modules located in the Townsite. These are designed as standard, campus type, telecommunications central offices.

Federal Building Central Office

OSTI Central Office

Townsite Services

- Townsite locations receive ORF-ICN telecommunicates services one of two ways:
  - Hardwired from one of the 5 ESS remote switches.
  - Via leased lines (T1s) from a local exchange carrier.
- Townsite E-911 calls are routed to the City of Oak Ridge.

Inter-site Cabling

- Townsite cable routing is accomplished through buried cable in public right-a-ways and on utility poles owned by the City of Oak Ridge.
- Fiber cabling is installed both in the City of Oak Ridge and across the DOE Reservation using direct burial methods and installation on poles using aerial conduit.

Oak Ridge National Laboratory

ORNL was established in 1943 as a part of the secret Manhattan Project to pioneer a method for producing and separating plutonium. During the 1950s and 1960s and with the creation of DOE in the 1970s, ORNL became an international center for the study of nuclear energy and related research in the physical and life sciences. By the turn of the century the Laboratory supported the nation with a peacetime science and technology mission that was just as important as, but very different from, the days of the Manhattan Project.

Today, ORNL has a staff of more than 4,200 and annually hosts approximately 3,000 guest researchers who spend two weeks or longer in Oak Ridge. ORNL is managed for DOE by UT-Battelle, LLC (a partnership between the University of Tennessee and Battelle) and its annual funding exceeds $1 billion. The laboratory's six major mission roles include neutron science, energy, high-performance computing, systems biology, materials science at the nanoscale, and national security.

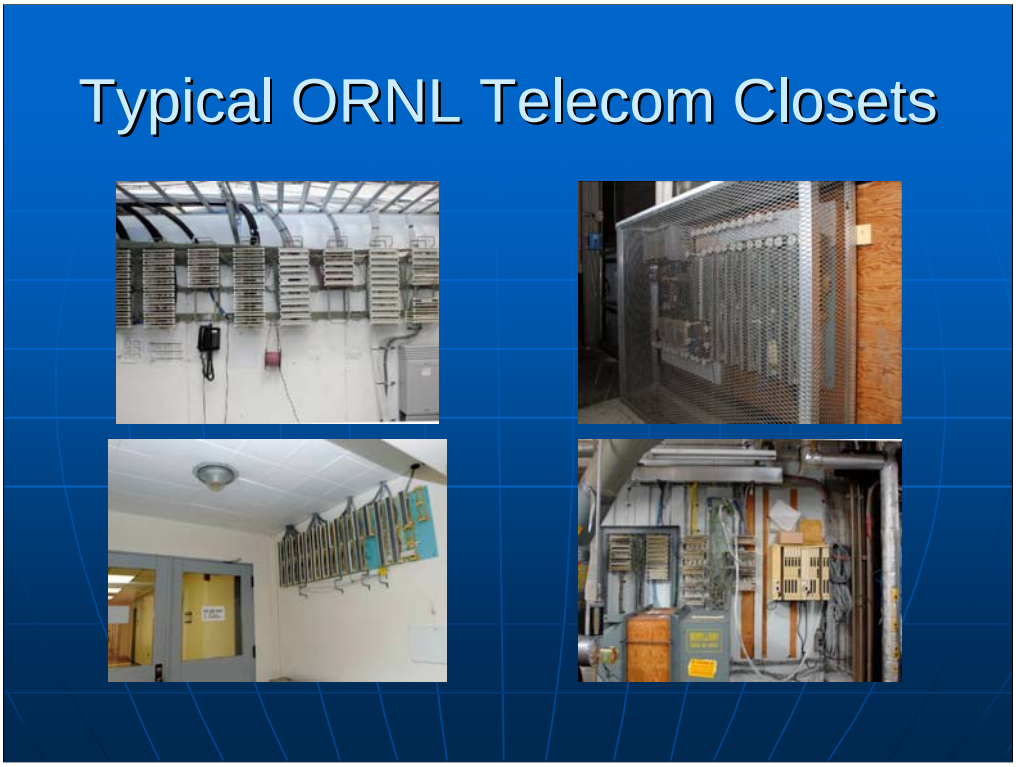
ORNL is home to the recently constructed $1.4 billion Spallation Neutron Source facility and is in the final stages of a $350 million project to provide a modern campus for the next generation of great science. A unique combination of federal, state, and private funds is supporting the construction of 13 new facilities.

This slide shows an aerial photograph of the main campus. A star is superimposed on the ORNL Central Office building (which also serves as the Site Main Distribution Frame (SMDF) for all campus fiber installations. In addition a photo of the wire-frame in the Central Office is shown and two street-level photographs of building 4500N).

ORNL Central Office (continued)



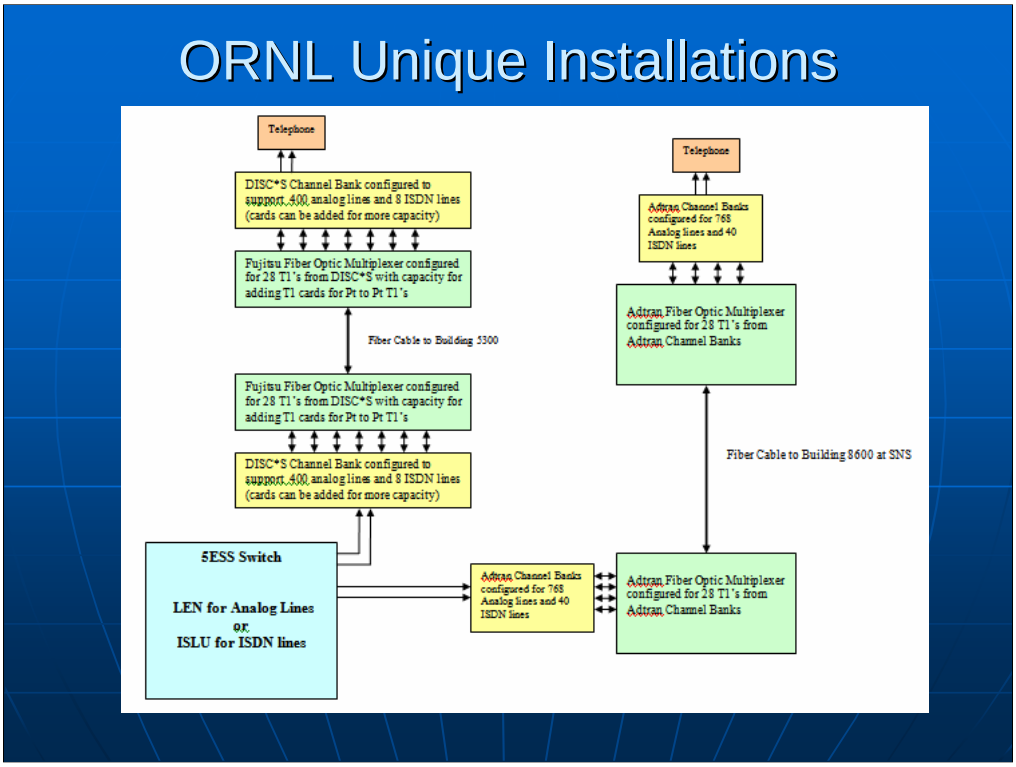

This slide gives four photographs from the interior of the Central Office. Clockwise from the upper-left are remote 5ESS switch module, the battery bank, the main wire-frame, and the Central Office-Annex room with [sparsely populated] wire-frame and LAN/WAN equipment.



This slide gives four photographs of some typical ORNL telecom closets . Clockwise from the upper left: a “full spec” communications room, a minimally-protected patch-panel, an unprotected patch panel (in a vestibule), and a patch panel in a storage area.

Typical ORNL Telecom Closets (continued)

This slide gives two more telecom closet photographs. While the closet area is dedicated and secure, it is barely large enough for cross-connect and there is no room for implementation of a key system (if required).



While [copper] T1s are used to feed electronic key sets in some buildings, two facilities on the ORNL campus are served exclusively by fiber connections: building 5300 and the Spallation Neutron Source (SNS). This slide gives a block diagram of these connections.

East Tennessee Technology Park

Bechtel Jacobs Company LLC (BJC) is the Environmental Closure contractor for the DOE-ORO located in Oak Ridge, Tennessee working under an accelerated schedule to complete cleanup at ETTP. BJC is responsible for environmental cleanup and waste management on the Oak Ridge Reservation. Bechtel Jacobs Company also supports DOE in a reindustrialization program to find commercial uses for many Oak Ridge facilities not currently utilized.

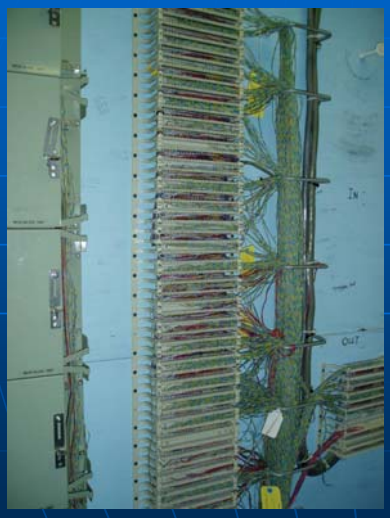
ETTP Central Office

This slide shows the two Central Office buildings located at ETTP. The picture on the left is the main Central Office which houses the 5ESS switch module, the picture on the right is adjacent to the Central Office and houses most of the fiber coming into ETTP.

ETTP Central Office (continued)

This slide shows four photographs from the interior of the Central Office. Clockwise from the upper-left are remote 5ESS switch module, the battery bank, the main wire-frame, and the punch down blocks behind the main wire-frame equipment.

Typical ETTP Telecom Closets



This slide shows three photographs of some typical ETTP telecom closets . These photographs are of a “full spec” communications room in one of the larger buildings.

Typical ETTP Telecom Closets (continued)

This slide shows a photograph of a telecom closet with unprotected punch down block and patch panel in a storage area.

Typical ETTP Telecom Closets (continued)

This slide shows three photos of the typical telecom closet layout in a trailer at ETTP. Most all of the trailers at ETTP have there own telecom closets generally located in a storage closet

Y-12 National Security Complex

Y-12 plays an important role in U.S. national security and is a one-of-a-kind facility in the National Nuclear Security Administration (NNSA) Nuclear Weapons Complex. Y-12's role includes:

- providing critical elements of the DOE NNSA missions that ensure the safety, reliability, and performance of the U.S. nuclear weapons deterrent;
- supplying the special nuclear material for use in naval reactors;
- promoting international nuclear safety and nonproliferation;
- reducing global dangers from weapons of mass destruction; and
- supporting U.S. leadership in science and technology.

Y-12 also uses its unique capabilities to support the Research Reactor Programs for U.S. and international customers, other federal agencies such as the Department of Defense and Department of Homeland Security, state and local governments, and private-sector companies.

Y-12 NSC and Central Office

Aerial photograph of the Y-12 NSC. Also shown is the ORF-ICN main facility at the Y-12 NSC. The main floor of this facility houses the 5E switching gear, power, and public network interfaces. The second floor is the location of the Service Order Center and Operator offices.

This slide shows four photographs from the interior of the ORF-ICN main Central Office. Shown are 5ESS switch, the battery bank, main cable entrance, and wire-frame.

Voice Mail and Conference Bridge

This slide shows the ORF-ICN voice mail (Octel) and conference bridge (Intellect) equipment.

TMS, Service Order Center, and Operator Offices

This slide shows the typical ORF-ICN offices on the upper floor of the Y-12 Central Office. There is a separate office for the TMS manager, and four cubicles in both the Operator and Service Order Center areas.

Y-12 PBXs

Y-12 recently installed two new Nortel PBXs to service two new facilities at the site. Shown is the larger of the two PBXs.

Unusual Conditions at Y-12

While Y-12 has many standard wiring closets, however, there are still legacy wiring frames located in hallways and attics. A typical wiring frame found in a hallway is shown. Y-12 also has many heavily loaded utility poles.